Peabody, Daniel (EGLE)

From: Peabody, Daniel (DEQ)
Sent: Tuesday, September 4, 2018 10:22 AM
To: Keiser, Jeff/MKE; saric.james@epa.gov; robertsk@cdmsmith.com; kirchnerSF@cdmsmith.com; Bennett, Brian <BennettBJ@cdmsmith.com> (BennettBJ@cdmsmith.com); John Bradley (DNRE) (BRADLEYJ1@michigan.gov)
Cc: Place, Beth (DEQ)
Subject: MDEQ Detailed Comments on Area 6 MNR Sample Plan
Attachments: Area 6 MNR Sampling Plan MDEQ Detailed Comments .pdf

Jim and Jeff,

Attached are the MDEQ detailed comments on the Area 6 MNR Sample Plan.

Thanks,

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Comment Author:		MDEQ		
Comment #	**Page**	**Section and paragraph**	**If applicable, specific quotation from text**	**Comment**
General Comments				
1.	---	---	---	The efficacy of monitored natural recovery as a remedial approach should include an evaluation of past and present empirical measurements and trends, and projections of these associated trends into the future. To develop such projections, all relevant and available historical data sets for a given area should be evaluated.
2.	---	---	---	Area 6 may include subareas with varying hydrodynamic, sediment transport, and/or biological characteristics. Any MNR sampling program (including sediment, surface water, and biota) should take into account the potential presence of such subareas and should be designed to evaluate the efficacy of MNR across them, including the potential use of a random sampling design.
3.	---	---	---	The historical data should be reviewed to develop an understanding of spatial and temporal trends, if any, in sediment bed contaminant concentrations. The conclusions from this analysis can be assessed against other lines-of-evidence such as bathymetry, shear stress regime, etc. to identify sediment sampling locations targeted to represent a range of environmental conditions – for instance, the deeper portion of the channel versus the shallows, areas of relatively high and low sediment concentrations/inventory, etc.
4.	---	---	---	The Sampling Plan should discuss preliminary estimates of the spatial and temporal sampling density needed to evaluate MNR within Area 6 in a statistically robust manner.
5.	---	---	---	Given the limited sample size (only one sampling event), certain goals of the Sampling Plan such as the range of PCB concentrations in surface water, and PCB concentrations transported into and out of Area 6 cannot be achieved by the proposed sampling plan. These goals can only be achieved by considering the historical surface water data. Therefore, the surface water samples proposed to be collected should be combined with the historical data to address the afore-mentioned goals of the Sampling Plan, as well as evaluations of long term surface water concentration trends.
6.	---	---	---	Future differential bathymetry evaluations should be included as an additional line of evidence for evaluating MNR.
7.	---	---	---	The analyses outlined in the sampling plan should include dioxins/furans in addition to PCBs. Please revise the document accordingly.
8.	---	---	---	The sampling plan should discuss in detail how porewater results will be used to evaluate MNR. Porewater concentrations can be influenced by a host of factors, including sediment organic carbon and contaminant concentrations, groundwater advective velocities, groundwater contaminant plumes, etc. MDEQ recommends that, at a minimum, cores be collected from passive sampling locations after the passive samplers have been retrieved. These cores should be analyzed for TOC and COC concentrations, and the same chemical analytes as the passive samplers (e.g., if passive samplers are analyzed for congeners, analyze the core for congeners). Ideally, measures of seepage velocity would also be collected. MDEQ also recommends that performance reference compounds (PRCs) be used to estimate the degree of equilibration achieved in passive samplers. Please revise the document accordingly.
9.	---	---	---	Any discussion of MNR trends needs to acknowledge that upstream activities (including remedial work) may have an impact on observed trends downstream. For example, will the sediment load heading into Lake Allegan remain at current levels, or will it decrease with the planned channel realignments, bank work, etc.? Please revise the document accordingly.
10.	---	---	---	MDEQ notes that it may request splits of the various sample media for its own analyses. MDEQ will work with Wood and EPA to collect these splits in such a manner as to not hinder field activities or sample processing.
Specific Comments				
11.	1-1	1.1 Site Background 1st paragraph	In addition, non-paper sources of PCBs were identified throughout the watershed.	All ongoing sources of contaminants of concern to Area 6 should be identified to fully evaluate the potential for MNR to serve as a stand-alone remedial technology or as a component of a broader remedial strategy. If these sources are no longer active, please identify the approximate time at which they ceased being a source so that historical trends in data (e.g., contaminant concentration as a function of depth in sediment bed and net sedimentation rate) can be properly evaluated.

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12.		1.1 Site Background 2nd paragraph	---	This section cites evaluations that are nearing two decades old. While acknowledging historical data and trends is a key aspect of MNR, these data and trends must also be evaluated against current data to determine to what degree the trends change or remain consistent with time. Please revise the document (or future documents) to compare data being collected to existing data sets.
13.	1-3	1.2 Site Description 3rd paragraph	River/lake use includes recreation (boating, swimming, and fishing), and the lake is frequently described as a major recreational/sport fishing area.	MDEQ notes that the exposure scenarios and risk assessments developed for the upstream reaches (e.g., floodplains, high energy rivers) may not necessarily be applicable to Area 6. MDEQ is happy to engage with EPA, the RPs, and their respective consultants on this topic under the workgroup format.
14.	1-4	1.2 Site Description	---	In the "Present Condition" column for chlorophyll-a it is indicated that the concentration is a 1999 average. Clarify whether the dissolved oxygen, secchi, and carp/catfish present condition values are for a specific year or for a different duration.
15.	1-4	1.3 History of Field Efforts	---	Revise the text to indicate if and how historical sediment, water column, and biota data were used to support the development of this sampling program. Review of the historical data for spatial and temporal trends can serve to better design a sampling program targeted to identify potential ongoing MNR.
16.	1-5	1.3.3 Historical Fish Collection Field Efforts	Adult SMB, YOY SMB, and adult carp tissues in Area 6 collected since the 1990s do not show a statistically significant trend in lipid-corrected PCB concentrations.	Was this trend evaluated recently or described in the LTM? If it is the latter, include a refence to the specific report.
17.	1-5	1.3.5 Historical SEDflume Field Efforts	Particle size, averaged over depth, decreased from upstream to downstream cores, indicating finer particle deposition in lower energy portions of the lake.	Revise the text to indicate if there is a spatial trend in the critical shear stress for erosion, either longitudinally or laterally, similar to the trend noted for particle size.
18.	1-5	1.3.5 Historical SEDflume Field Efforts	Average particle size was reported to be 15 to 20 micrometers.	Clarify if this is the depth-averaged value for all of Area 6, including both upstream and downstream cores.
19.	1-6	1.4 Study Purpose	---	This section does not describe how velocity transects, sediment erodibility, and water column PCB measurements relate to MNR lines-of-evidence. Revise the text to make the connection between these planned data collection efforts and the study purpose.
20.	1-7	1.4 Study Purpose Sediment Aging	The accumulation rate of sediments can be calibrated by the peaks in observed ^{137}Cs activity associated with known years of atmospheric nuclear weapons testing.	Specify or provide examples of the years that these nuclear weapons testing events coincide with for document clarity.
21.	1-8	Section 1.4 Study Purpose. Water Column Sampling	---	Only 1 event is proposed for water column sampling. This will be of no use for any kind of analysis - mass balances, temporal trends, or spatial trends. Such analyses can be performed only by the inclusion of more samples either by additional data collection or by combining with the larger historical LTM dataset. Revise the text accordingly.
22.	1-8	Section 1.4 Study Purpose. Velocity Profile Measurements	---	The velocity profile transects will be of greater utility for hydrodynamic model calibration purposes if the quarterly surveys are targeted to coincide with periods of high and low river flows and thus bracket the range of flow conditions and shear stress regimes in the system. Revise the text to include a rationale for the timing of the velocity profile measurements.
23.	1-8	Section 1.4 Study Purpose. Velocity Profile Measurements	These models have been previously presented in SRI/FS documents in upstream Areas.	The text acknowledges that Area 6 is different from upstream areas. The text should be revised to include a discussion of how that would affect the previously used models, if at all.
24.	1-8	Section 1.4 Study Purpose. Fish Tissue Sampling 1st paragraph	SMB YOY historically were collected as whole-body composites in the LTM and are indicators of short-term improvement in sediment concentrations.	The word "improvements" should be edited to "changes".
25.	1-9	1.5 Data Quality Objectives. Step 1 – State the Problem. The Problem	Historical deposition of PCBs has occurred in Area 6 river and lake sediments.	The referenced statement omits mention of any potential ongoing deposition. Revise the text to include potential ongoing deposition of PCBs and dioxins/furans.

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26.	1-9	1.5 Data Quality Objectives. Step 1 – State the Problem. Conceptual Site Model	PCBs have been deposited into Lake Allegan from sources upriver.	The referenced statement omits mention of any local sources (e.g. lateral loadings from tributaries, stormwater, etc.), or groundwater transport in impacting PCB fate and transport in Lake Allegan. Revise the text to include a discussion of these additional processes, as appropriate.
27.	1-10	1.5 Data Quality Objectives. Step 1 – State the Problem. Conceptual Site Model	Vertical layering, starting at the bottom, consist of natural sediments, sediments containing PCBs, a mixed layer of recent depositional material and sediment containing PCBs, a recent depositional material/surface water interface, and surface water.	Clarify the text to indicate if the '*recent depositional material/surface water interface*' does or does not contain any PCBs.
28.	1-10	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Decision Problems.	---	The decision problems should include a bullet on differential bathymetry evaluations and how they demonstrate variations in erosional/depositional properties within the Area.
29.	1-10	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Estimation Problems. 5th bullet point	Will sediment core, pore water data, sediment stability, and velocity measurements serve as an appropriate baseline comparison with future collection of biological, chemical, and physical data to evaluate the effectiveness of MNR?	As stated in the general comments, differential bathymetry should be included as another line of evidence. Revise the text accordingly.
30.	1-10	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Estimation Problems. 5th bullet point	What is the range of PCB concentrations in pore water and in the overlying surface water?	The range of concentrations in surface water cannot be reliably determined based on a single sampling event. Revise the text to clarify how the range of concentrations will be established or delete this bullet item.
31.	1-10	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Estimation Problems. 6th bullet point	What are PCB concentrations of sediment transported into and out of Area 6?	The PCB concentrations of sediment transported into and out of Area 6 cannot be reliably determined based on a single sampling event. Revise the text to clarify how the PCB concentrations of sediment transported into and out of Area 6 will be established or delete this bullet item.
32.	1-11	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Decision Statements. 1st bullet point	Implement an initial investigative strategy that is valid, unbiased, defensible, and reproducible that will result in a sufficiently robust dataset for conducting statistical evaluations.	Reconcile the intent of developing statistically reliable evaluations mentioned here with the very last complete sentence on page 1-6 which portrays this initial data collection program as not intended to be statistically robust. Also note that there is a significant amount of existing information, so indicating that this is an initial investigation is misleading. Revise the text as appropriate.
33.	1-11	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Decision Statements. 3rd bullet point	Estimate particulate PCB concentrations in surface water.	The estimated particulate PCB concentrations in surface water cannot be considered truly representative of the system since it is based on a single sampling event. Revise the text to clarify how a representative particulate PCB concentration in surface water will be established or delete this bullet item.
34.	1-11	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Decision Statements. 4th bullet point	Determine whether a relationship exists between pore water PCB concentrations and PCB migration potential, dissolution, and bioavailability.	Clarify how this PCB migration potential will be determined without any seepage information to calculate potential porewater contaminant transport rates.
35.	1-11	1.5 Data Quality Objectives. Step 2 – Identify the Goal of the Study. Decision Statements. Last bullet point	Evaluate fish tissues PCB concentration trends in carp and SMB YOY	Fish tissue trends in adult SMB should also be evaluated. LTM data is available for adult SMB so fish tissue trends should continue to be evaluated because that is what people are likely to eat. Sampling frequencies and sizes for SMB will need to be coordinated with and approved by the Michigan Department of Natural Resources (MDNR) Fisheries Division. It should be acknowledged that, despite support and approval from the USEPA and MDEQ, MDNR Fisheries will need to review, approve and issue fish collection permits as needed and, ultimately, the SMB fishery may not support the sample size and frequency that is proposed. Revise text as appropriate.

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36.	1-11	1.5 Data Quality Objectives. Step 3 – Identify Information Inputs. Information Required to Resolve the Decision Statement	---	As stated in previous comments, the data collection efforts should include bathymetric surveys to inform differential bathymetry evaluations.
37.	1-12	1.5 Data Quality Objectives. Step 3 – Identify Information Inputs. Source of Required Information	---	Additional sources of information that may be relevant to this analysis include (1) records for flow inputs to Lake Allegan (from Allegan City Dam, Rossman Creek, and Dumont Creek) in order to relate flow conditions to shear stresses and potential for erosion, and (2) historical water column data from the LTM program. Revise text accordingly.
38.	1-12	1.5 Data Quality Objectives. Step 3 – Identify Information Inputs. Source of Required Information	In addition to the LOE described in Section 1.4, the sources of required information are:	Provide rationale for excluding historic water column data.
39.	1-12	1.5 Data Quality Objectives. Step 3 – Identify Information Inputs. Establish Action Levels 1st paragraph	The PRG of 0.33 milligram per kilogram (mg/kg) in sediment will apply to Area 6.	This is an entirely different setting than upstream, so it cannot be assumed that the same exposure scenarios, and consequently the same PRGs, apply here. MDEQ would like to engage with EPA, the RPs, and their respective consultants in the workgroup format to discuss this issue.
40.	1-12	1.5 Data Quality Objectives. Step 4 – Define the Boundaries of the Study	Previous sediment aging investigations indicated peak PCB deposition in relation to peak ^{137}Cs activity at depths from 7 to 40 in (Figures 1-3a and 1-3b).	The figures show sediment aging data from the years 2000 and 2009. Provide references for the studies that correspond to this information.
41.	1-13	1.5 Data Quality Objectives. Step 5 – Develop the Analytical Approach	Upon receipt and validation of the laboratory data, statistical evaluations will be performed, as well as estimation or other modeling approaches. The evaluations will include determination of the data distribution, data summary statistics, correlations, and upper 95 percent confidence limits about the mean, as appropriate. Temporal trends in concentration will be evaluated using regression models where applicable.	a) The statistical evaluations described in the referenced text seem to contradict the intent of the data collection program as described on the very last complete sentence on page 1-6 which portrays this initial data collection program as not intended to be statistically robust. Revise the text as appropriate. b) The sampling design needs to be coordinated with previous monitoring events to re-occupy the right locations so data is temporally comparable.
42.	2-1	2.0 Sampling Locations 2nd paragraph	This initial collection of data is not intended to be statistically robust for testing whether MNR is appropriate, but rather is for an initial understanding of current conditions in Area 6.	This statement implies that data will not be adequate to estimate trends and contradicts the text on Page 1-13, Section 1.5 (see Comment 41) which indicated that temporal trends will be estimated. As this data will likely be compared to previous and future sampling events, it should be statistically robust and spatially dense enough to assist in evaluating the efficacy of MNR within Area 6. Revise the text accordingly. Furthermore, MDEQ requests that an additional webinar be conducted to discuss the process for comparing these data to previous and future sample information.
43.	2-1	2.0 Sampling Locations 2nd paragraph	Sampling locations for each LOE may be reduced or added after evaluation of the 2018 data.	Sampling locations should not be reduced between the sampling events. Reducing sample locations removes the ability to evaluate the various MNR lines of evidence at a broader range of Lake Allegan locations and conditions. Revise the text accordingly.
44.	2-1	2.1 Sediment PCB Sampling Locations	Core locations were selected to cover a range of historical sediment PCB concentrations greater than 1.0 mg/kg and to include the riverine and impounded portions of Area 6.	Provide the rationale for using the 1.0 mg/kg threshold to select core locations.

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45.	2-1	2.1 Sediment PCB Sampling Locations	Selection of these cores provides data for comparison of historical cores to current condition cores.	Existing sediment information should also be utilized to develop an understanding of temporal changes, if any, in sediment bed contaminant concentrations. Revise the document accordingly.
46.	2-1	2.1 Sediment PCB Sampling Locations	---	The proposed sampling locations should be reviewed after bathymetry data is available and target a range of hydro-sedimentological conditions, primarily distinguishing between the deeper portion of channel versus shallows where there is a difference in the bed shear stress regime and potential differences in contaminant concentration profiles and inventory. Revise the text as appropriate.
47.	2-1	2.2 Sediment Aging Core, Pore Water, SEDflume and Velocity Profile Sampling Locations	The other three core locations were previously sampled for PCBs; however, aging cores will yield sediment deposition information at these locations.	According to Figure 1-2b, these three locations show low to moderate total PCB IPWCs. Provide rationale for selecting these locations instead of locations with higher PCB concentrations.
48.	2-1	2.2 Sediment Aging Core, Pore Water, SEDflume and Velocity Profile Sampling Locations	---	Revise the text to include the rationale for selecting locations for collecting Sedflume cores. The core locations may be better targeted by using a physically-based rationale – for instance, by targeting areas of high and low velocities (i.e. shear stresses) in the cross-section. Qualitatively, cores from areas experiencing higher shear stresses are expected to be less erodible than cores from areas experiencing lower shear stresses. Review the targeted locations and revise as appropriate.
49.	2-1	2.3 Water Column Sampling Location	---	In addition to the two proposed water column sampling locations, MDEQ recommends an additional sampling station at Lake Allegan Inlet (RM 31; Lincoln Rd/Rt 89 Bridge). This location has been sampled continuously from 2000 onwards (same time period as Calkins Dam) whereas Allegan City Dam was only sampled in 2000-2001. The additional location will be useful in the assessment of long-term temporal trends in water column PCB concentrations. Revise the text to include this additional location.
50.	2-2	2.3 Water Column Sampling Location	Surface water at this location will be analyzed for total and dissolved PCBs, TSS, and TDS to estimate PCB concentrations in sediment transported in and out of Area 6.	In addition to the listed analytes, consider also measuring POC and DOC to assist with estimating the partition coefficient for future use, and for estimating carbon-normalized particulate-phase PCB concentrations which may be useful for risk assessment purposes. Revise the text as appropriate.
51.	3-1	3.1.1 Sediment PCB Core Sample Collection 1st paragraph	Twenty sediment cores will be collected at selected locations of historical cores collected in Area 6.	Revise the text to provide the acceptable distance between the historical and new sampling locations if the exact location cannot be reoccupied during sampling.
52.	3-2	3.1.4 Sediment PCB Core Analytical Parameters	---	Consider including Solids Content in the list of analytes to be measured. Solids content can be used to estimate dry density (which is a surrogate for sediment substrate and potentially also sediment erodibility), and PCB mass inventory. Revise the text as appropriate.
53.	3-2	3.1.4 Sediment PCB Core Analytical Parameters	Samples deeper than 36 in will be analyzed if necessary for vertical delineation.	Revise the text to include examples of when this may be necessary. This statement implies that there is an expected vertical gradient or pattern in contaminant concentrations which may not be the case.
54.	3-3	3.2.3 Sediment Aging Core Sample Processing 1st paragraph	Triplicate cores will be scored for selection of the best cores.	Revise the text to note that “core scoring” is provided in Appendix B-1b. MDEQ notes that it may provide additional comments on this topic as planning and evaluations continue.
55.	3-6	3.4.2 Water Column Sample Identification	---	The sample ID for the water column samples should include “A6” as a prefix, similar to the other samples being collected in sediment and pore water. Revise as appropriate.
56.	3-7	3.5.1 SEDflume Sample Collection	---	The six cores collected for SEDflume analysis will be shipped from Michigan to California for testing. Revise the text to include a discussion of the potential effect of vibrations and other physical impacts likely during transport on the structural integrity of the cores and its erodibility.
57.	3-9	3.7.1 Supplemental Fish Sample Collection	Water quality metrics and data collection should match the LTM plan (Amec Foster Wheeler 2017).	Revise the text to specify which water quality metrics will be collected.
58.	4-1	4.0 Reporting and Schedule 2nd paragraph	If deviations from the submitted and approved schedules are deemed prudent because of safety	In addition to notifying EPA, MDEQ requests that it be notified of any deviations from approved schedules as well.

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			issues or other concerns, an updated schedule will be submitted to USEPA for review and approval, along with the rationale for the request.	
59.	4-2	4.4 Water Column Sampling	---	Since water column PCB concentrations are being determined on both an aroclor and a congener basis, will the data quality evaluation address major variances in total PCB concentrations calculated by summing aroclors vs congeners? Provide clarification in the text.
60.	4-2	4.7 Fish Sampling	PCB results will be summed to yield total PCBs for each sample.	All other subsections state if aroclor or congener results will be summed to yield total PCBs. Clarify whether the total PCBs for fish tissue sampling will be based on aroclor or congener analysis. Also note that congener and aroclor results will be provided to EPA and MDEQ.
61.	---	Figures 2-2a	---	The surface water sampling location is hard to see against the green satellite imagery. Please revise the figure by using a brighter color to identify the surface water locations.
62.	---	Appendix B-1b. Sediment Aging Core Collection Procedures. 2nd paragraph	---	Please revise the text to include the radius within which additional attempts to collect sediment cores will be made.
63.	---	Appendix B-2b. SP3 Sampler Deployment and Retrieval Using Sampler Cartridges	---	Please provide the deployment time for the SP3 samplers and discuss how it will be confirmed that equilibrium has been achieved. As noted in General Comments, MDEQ recommends that PRCs be used to estimate the degree of equilibration achieved in the passive samplers.